Getting Started in Computer Science
Freshmen Students

Department of Computer Science
http://cs.gmu.edu/
Volgenau School of Engineering

Agenda

PLEASE SIGN IN !!

• Department information
• General information
• Program information
  • The BS CS Degree Program
  • The BS ACS Degree Program
• What do I register for?
• Questions?

Department Info

• The CS Department office is located in the Nguyen Engineering (ENGR) Building, Room 4300
  • Department Chair: Dr. Sanjeev Setia
  • Acting Associate Chair: Dr. Jan Allbeck – oversees the undergraduate programs
  • CS Undergraduate Advisors: Ms. Kara Smith and Ms. Katie Doyle
  • There are over 45 full time Faculty in the Department and their offices are located on the 4th and 5th floors of the ENGR building
• We’re part of the Volgenau School of Engineering (VSE) which contains the following Departments:
  • COMPUTER SCIENCE
  • Bioengineering
  • Civil & Environmental Engineering
  • Electrical and Computer Engineering
  • Information Sciences and Technology
  • Mechanical Engineering
  • Statistics
  • Systems Engineering & Operations Research

General Information

• Activate your Mason ID and password at password.gmu.edu
  • All information to/from you and Mason is sent to your Mason email
• The CS Department website is cs.gmu.edu
  • It contains Student FAQs, contact information for faculty, course syllabi, jobs and student organization information
• The Mason Registration system is called PatriotWeb: patriotweb.gmu.edu
  • Use this website to register for classes
  • Use this website to check your degree progress (DegreeWorks)
  • Use this website to check your advanced placement or transfer credit
• The Mason Catalog is online: catalog.gmu.edu
  • Check it frequently for reference to your degree requirements
• The Mason Transfer Admissions website is: admissions.gmu.edu/transfer
  • Check it for AP/IB and Transfer equivalencies: http://admissions.gmu.edu/transfer/transferCreditSearch.asp

• George Mason University has an Honor Code !!
  • Make sure you understand what your responsibilities are.
  • Go to the Mason Honor Code website:
    • oai.gmu.edu

• The Computer Science Department also has an Honor Code for Programming Projects.
  • It is strictly enforced!

Undergraduate Degree Programs

• We offer two undergraduate BS degrees:
  • BS Computer Science (BS CS)
  • BS Applied Computer Science (BS ACS)

• Both degrees require a minimum of 120 credit hours = 4 years full-time

• Other program options:
  • Software Engineering Minor (16 credit hours)
  • BS/Accelerated MS options (144 credit hours)

Course Policies

• Course designations at Mason:
  • 100 level courses are typically for freshmen
  • 200 level courses are typically for sophomores
  • 300 level courses are typically for juniors
  • 400 level courses are typically for seniors

• Courses must be taken in sequence
  • Almost every course has a prerequisite chain
  • Prerequisites are enforced by the registration system

• You must earn a C or better in a CS or MATH class in order to take the follow-on course

• Courses offered by the department may only be taken a most three times; failure to pass a required Math or CS course after three attempts results in termination from the major

• Selective Withdrawal:
  Every GMU undergrad is allowed three selective withdrawals where you can to drop a course after the drop date (but before the selective withdrawal deadline) - use these wisely!

• One C-/D rule:
  Computer science majors are permitted to use one “C-” or “D” grade within Major coursework toward graduation, as long as that course is not a prerequisite for another class.
BS CS Educational Objectives

- The BS CS program is accredited by Computing Accreditation Commission of ABET (www.abet.org)
- The objectives of the BS CS degree are to provide our graduates with
  - A foundation for successful careers in industry:
    - graduates will have a broad understanding of the fundamental concepts, methodologies and tools, and applications of computer science.
  - A foundation for graduate study:
    - graduates of the program will have the academic preparation for successful completion of rigorous graduate programs.
- Professional preparation:
  - graduates will have effective written and oral communication skills, and be able to work collaboratively in a professional and ethical manner.

The BS CS Curriculum

- Mason Core requirements (21 credits)
  - Foundation: English composition courses
  - Core: Literature, Western Civ., Social & Behavioral Sciences, Global Understanding, Fine Arts
- Major requirements (95 credits)
  - Required CS courses (33 credits)
  - Mathematics and Engineering courses (23 credits)
  - CS-Senior elective courses (15 credits)
  - CS-Related elective courses (6 credits)
  - Natural Sciences (12 credits)
  - Communications 100 - Public Speaking (3 credits)
  - Humanities (3 credits)
- General Electives (4 credits)
  - Note: Physical activity and remedial math classes do not count towards graduation

Major Requirements (CS Core)

- CS 101
  - Preview of Computer Science
- CS 105, CS 306
  - Ethics & Society; Ethics & Law for the Computing Professional
- CS 112, 211, 310
  - Introduction to Programming; Object-Oriented Programming; Data Structures
- CS 262, 367, 465; ECE 301
  - Intro to Low-level Programming; Computer Systems and Programming; Computer Systems Architecture; Digital Electronics
- CS 321
  - Software Engineering
- CS 330, 483
  - Formal Methods & Models, Analysis of Algorithms

Five CS-Senior electives:

- CS 463 or 471 or 475
- Four additional courses chosen from
  - CS 425 - Game Programming I
  - CS 440 - Language Processors and Programming Environments
  - CS 450 - Database Concepts
  - CS 451 - Computer Graphics
  - CS 455 - Computer Communications and Networking
  - CS 463 - Comparative Programming Languages
  - CS 468 - Secure Programming and Systems
  - CS 469 - Security Engineering
  - CS 471 - Operating Systems
  - CS 475 - Concurrent and Distributed Systems
  - CS 477 - Mobile Application Development
  - CS 480 - Introduction to Artificial Intelligence
  - CS 482 - Computer Vision
  - CS 484 - Data Mining
  - CS 485 - Autonomous Robotics
  - CS 490 - Design Exhibition
  - CS 499 - Special Topics in Computer Science
  - MATH 446 - Numerical Analysis I or OR 481 - Numerical Methods in Engineering
Course Prerequisite Chains

Major Requirements (Math & ECE)

- MATH 113, 114, 213
  - Calculus I, II, III
- MATH 125, 203, STAT 344
  - Discrete Math,
  - Linear Algebra
  - Prob/Stat for Engineers
- ECE 301
  - Digital Electronics

Prerequisite Chains

Major Requirements (continued)

- Natural Science:
  - 12 credits that must include a two-semester laboratory sequence chosen from:
    - ASTR 111 (3)/112 (1), 113 (3)/114 (1)
    - BIOL 103 (4), 104 (4)
    - CHEM 211 (3)/213 (1), 212 (3)/214 (1)
    - GEOL 101 (4), 102 (4)
    - PHYS 160 (3)/161 (1), 260 (3)/261 (1)
    - EVPP 110 (4), 111 (4)
- CS Related elective courses
  - Two courses selected from an approved list of ECE, OR, PHIL, STAT, SWE, SYST, MATH, or CS courses (see catalog)
- Humanities: (3 additional credits)
BS Applied CS Degree

• BS Applied Computer Science
  • Created for students who want to work in one of the many disciplines that require advanced computing techniques.
  • Concentrations: bioinformatics, game design, geography, and software engineering
  • Students take foundation and core CS courses along with foundation and core courses in the concentration area.

BS ACS Degree Requirements

• All concentrations share the same common foundation requirements as the BS CS:
  • CS 101 (Preview of Computer Science)
  • CS 105 (Computer Ethics & Society)
  • CS 112 (Introduction to Computer Programming)
  • CS 211 (Object-Oriented Programming)
  • MATH 113, MATH 114, MATH 125, MATH 203, STAT 344
    Calculus I, II, Discrete Mathematics, Linear Algebra, Prob & Stat for Engineers
• All concentrations share the same common core requirements as the BS CS:
  • CS 262 (Intro to Low-Level Programming) / ECE 301 (Digital Electronics)
  • CS 306 (Law and Ethics for the Computing Professional)
  • CS 310 (Data Structures) / CS 330 (Formal Methods and Models)
  • CS 367 (Computer Systems & Programming)
  • CS 321 (Software Engineering)
  • CS 465 (Computer Systems Architecture)
  • CS 483 (Analysis of Algorithms)
• All concentrations must include one additional CS course numbered above 400

Concentration Requirements

• Concentration in Bioinformatics*
  • Foundation: PHYS 160/161, CHEM 201, BIOL 213, STAT 344
  • Core: BINF 450, BIOL 482, BIOL 580; CS 306, 444, 445, 450
  • Two approved electives related to bioinformatics
• Concentration in Computer Game Design*
  • Foundation: CS 225, 306, 325, 351; AVT 104; STAT 344
  • Core: CS 425, 426, 451; AVT 382, 383
  • One approved elective related to game design
  • PHYS 160/161, one additional lab science course

• Concentration in Geography*
  • Foundation: GGS101, 102, 103, 110, 300; STAT 344
  • Core: CS 306; GGS 310, 311, 411, 412, 416, 463
  • One GGS course numbered above 300
• Concentration in Software Engineering*
  • Foundation: STAT 344; CS 306
  • Core: SWE 205, 301, 401; CS 332, SWE 437
  • Five courses chosen from:
    • CS 450, 455, 463, 468, 471, 475; SWE 432, 443
    • ENGL 388 & one of the following:
      • PSYC 333, COMM 320, COMM 335

*Not all concentration courses are offered every semester
What Do I Register For?

- If your Math Placement Score qualifies you for MATH 113 (Calculus I), then you should sign up for
  - CS 101 (Preview of Computer Science)
  - CS 112 (Introduction to Computer Science)
  - MATH 113 (Calculus I)
  - Mason Core classes (See the Sample Schedule handouts)
  - Classes needed for your ACS concentration (See the Sample Schedules handouts) if you are ACS major
- If your score does not qualify you for MATH 113, then
  - You should register for MATH 105 (Pre-Calculus) or MATH 104 (Trig & Transcendental Functions) or MATH 123 (Calculus with Algebra/Trig Part A) as appropriate
  - You should register for courses that satisfy the Mason Core requirements instead of taking CS classes (see the Sample Schedule handout for students who start with Math 104 or 105)
  - Next semester, if you have earned a C or better in MATH 104/105/123 or passed the Placement Test, you should register for
    - CS 101
    - CS 112
    - MATH 113
    - ...

Freshman FAQs

- What should I do if I had AP or IB coursework in High School?
  - Depending on your score,
    - You might receive Mason credit for CS 112 if you took the AP Computer Science exam
    - You might receive Mason credit for MATH 113 if you took the AP Math exams
    - Check the admissions.gmu.edu/transfer website for score equivalencies
    - Make sure Mason has evidence that you received AP or IB credit or you will not be able to register for follow on courses
- Can I test out of a computer science class?
  - You may apply to take a test for CS 211 equivalency if you received a 5 on the CS AP A exam and the Department agrees that you have the necessary knowledge to attempt the exam.
  - Contact the Department (csadmin@cs.gmu.edu) to set up an interview.
  - You must pass the test to be waived from CS 211. You will need to replace the credits with a higher level CS class.

Mason Core

- How do I select Mason Core courses?
  - The catalog has a list of courses for each category: e.g. Fine Arts, Social & Behavioral Sciences, Literature, etc.
  - Consult the online Mason catalog under Mason Core here:
    - catalog.gmu.edu
  - It lists the courses that qualify for each of the Core categories

Getting Help

- After classes begin, you will be assigned a CS Faculty Advisor. We will email you to let you know who your Faculty Advisor is.
- If you have concerns about meeting the prerequisites for a class, contact the CS Department.
- If you are in need of assistance before the semester starts, contact the CS Department Office staff.
  - We are open 9 – 5pm every day.
  - Email: csadmin@cs.gmu.edu
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<th>What Happens Next?</th>
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<tbody>
<tr>
<td>• Activate your Mason ID and password</td>
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<tr>
<td>• Take the Math Placement Test</td>
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<tr>
<td>• Use PatriotWeb to determine the day/times for the classes that you want to take</td>
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<tr>
<td>• Register on PatriotWeb.</td>
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<td>• Go to the registration site at the time and location listed for Orientation.</td>
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<tr>
<td>• Any questions?</td>
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